STATUS OF InP-BASED METAL ORGANIC MBE WITH REFERENCE TO CONVENTIONAL MBE AND MOVPE

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Abstract

The applicability of selective area MOMBE for the monolithic integration of optoelectronic devices has been demonstrated. Selective deposition, either selective area or selective infill growth, was successfully applied to accomplish butt-coupling of active laser-type and passive or electro-optic waveguide-type devices in different laboratories. Regarding butt-joints MOMBE basically offers distinct advantages because its growth habit is virtually independent of geometrical mask pattern effects due to the absence of gas-phase related diffusion effects resulting in a simplified deposition process. Development of an optimized MOMBE growth process resulted in vertical sidewalls in combination with uniform material properties up to lateral growth interfaces thus avoiding MOVPE related deficiencies like enhanced growth rates near masked areas limiting compactness of PIC design. Nevertheless, this gain available by MOMBE is contrasted by the enhanced complexity of MOMBE arising from the combination of technical, i.e. need of UHV conditions, and chemical, use of metalorganic sources, challenges.